

THE EFFECT OF HORTICULTURAL COMMUNITY SERVICE PROGRAMS ON
RECIDIVISM NUMBERS OF OFFENDERS

by

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DEDICATION

This dissertation is dedicated to my beautiful and loving mother, Julie Lyn Holmes.

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ABSTRACT

The average cost of housing a single inmate in the United States is roughly \$31,286 a year, bringing the total average cost states spend on corrections to an average of more than \$50 billion a year. Statistics show 1 in every 34 adults in the United States is under some form of correctional supervision; and after 3 years, more than 4 in 10 prisoners return to custody. The purpose of this study was to determine the differences in incidences of recurrences of offenses/recidivism of offenders completing community service in horticultural versus non-horticultural settings. Data were collected through obtaining offender profile probation revocation reports, agency records, and community service supervision reports from the Hays County Probation Office in San Marcos, Texas. The sample included both violent and non-violent and misdemeanor and felony offenders. Offenders who completed their community service in horticultural or non-horticultural outdoor environments showed lower rates of recidivism when compared to offenders who completed their community service in non-horticultural indoor environments and those who had no community service. The results and information gathered support the continued notion that horticultural activities can play an important role in influencing an offender's successful reentry into society.

I. INTRODUCTION

With recent large-scale growth in incarceration rates and American prison populations on the rise (Mears et al., 2012), researchers have considered reasons behind offenders' decisions to reoffend and strategies to reduce the reoccurrence of an offense. According to the Bureau of Justice Statistics (BJS), by the end of 2011, the United States had a total of 2,266,800 incarcerated adults with an additional 4,814,200 adults on probation or parole (Glaze and Parks, 2011). Between 2012 and 2013, those sentenced and facing incarceration in a state or federal facility increased by 5,400 prisoners (Carson, 2014). However, in 2014, a 2% overall average decrease was reported among populations within private correctional institutions, reflecting 15,400 less incarcerated individuals per facility (Carson and Anderson, 2016). Furthermore, statistics showed 1 out of every 34 adults (nearly 3%) living in the U.S. is "under some form of correctional supervision" (Glaze and Parks, 2011, p. 1), and more than 4 out of every 10 prisoners (approximately 40%) return to custody after having only been released 3 years prior (Trusts, 2011; Henrichson and Delaney, 2012).

The average cost of housing a single inmate is roughly \$31,286 a year, bringing the total overall cost states spend on corrections to an average of more than \$50 billion a year (Trusts, 2011; Henrichson and Delaney, 2012). "A state's recidivism rate is the product of numerous variables and valid interstate assessments" (Trusts, 2011, pg. 12). According to DeLisi (2001) extended unemployment, physical handicaps, mental illnesses, and repeated run-ins with the law throughout adolescence are common characteristics among repeat offenders who remain in the criminal justice system throughout their lives (Clear et al., 2001). Researchers have also found "family, school,

and inner-city environments show vicarious victimization and contact with angry, hostile others are related to higher levels of criminal involvement” (Agnew, 2006; Listwan et al., 2011, p. 162).

The Pew Center, “a division of the Pew Charitable Trusts that identifies and advances effective solutions to facing critical issues,” states the revolving door of offenders can be contributed to one of two factors: 1) “committing a new crime that results in a new conviction” or 2) “a technical violation of supervision, such as not reporting to their parole or probation officer or failing a drug test” (2011, p. 2; p. 7). Research has indicated factors such as “age, criminal background, drug-use, education, and employment status are important for understanding recidivism outcomes for men and women” (Gendreau et al., 1996; Lagan and Levin, 2002; Cobbina, 2010, p. 210).

Researchers Bales and Mears (2008) found support and communication from family and friends throughout the duration of an inmate’s time served behind bars to be an important variable shown to reduce recidivism upon reentry into society. “Marital status and stable employment,” especially for men, are key when analyzing factors influencing offenders to disconnect from crime (Sampson and Laub, 1993; Laub et al., 1998; Cobbina, 2010, p. 210). Offenders, similar to everyone else, “respond better to the prospect of awards rather than the fear of punishment” (Trusts, 2011, p. 31).

Transition from incarceration back into society can be very difficult, and rehabilitation can prove to be a long and demanding road for both male and female offenders. Programs such as the Green Brigade for juvenile offenders and the Master Gardener program for adult offenders, provide a solid foundation of knowledge in horticulture with an emphasis in vocational rehabilitation (Cammack et al., 2002a;

Polomski et al., 1997). The Master Gardener program found “offering green-industry job skills, [coupled with] successfully completing the program, offered inmates a sense of academic accomplishment and sparked their interest in horticulture” (Polomski et al., 1997, p. 360). Cammack et al. (2002a, p. 77) found participants in the Green Brigade program showed improved environmental attitudes versus those juvenile offenders who did not participate in the program. In turn, offenders participating in these programs learned skills that helped to improve their “self-esteem, locus of control, interpersonal relationships and attitudes” (Cammack et al., 2002b, p. 82).

The benefits of human interactions with plants and nature have been noted throughout history, and the concept of a symbiotic relationship between the two is far from new. Dating back over 6000 years, Egyptians were known for using “the sun and the sky as well as every form of life” for enriching their lives (Janick, 2000, p. 24). Recent discoveries of “about 2000 species of flowering aromatic plants have been found in [ancient Egyptian] tombs” across Egypt (Janick, 2000, p. 26), with illustrated pictures detailing advanced horticultural technology across their tomb walls. Native Americans also praised the blessing bestowed upon them from their natural environment (Lohr and Relf, 2000), intuitively integrating the fundamentals of horticulture not only into their daily lives but their spiritual lives as well.

Researchers have documented the benefits of horticulture and different “aspects of nature such as open views, closeness to water, and a place of refuge” on humans, as well as improvements on perceptions of quality of life (Söderback et al., 2004, p. 245). Using the Life Satisfaction Inventory A (LSIA), developed by Neugarten et al. (1961), Sommerfeld et al. (2010) reported older adults who gardened had higher overall life

satisfaction scores when compared to older adults who did not garden. Researchers Waliczek et al. (2005) used the LSIA and found physical activity levels and overall general health were higher among gardeners when compared to nongardeners. Esteem, self-actualization, and pride were all reported higher among individuals who were active gardeners (Waliczek et al., 1996 and 2005). Another study conducted by Doxey et al. (2009) revealed the statistically significant impact of interior plants in positively influencing university students' overall perceptions of their college courses and instructors. It is noted, the classrooms most significantly affected from the presence of interior plants were those classrooms "void of [any] other natural elements" (Doxey et al., 2009, p. 309).

Researchers are continuing to look into the numerous variables associated with the benefits of interactions between plants and nature on non-criminal individuals and their quality of life. However, fewer studies are being conducted on much narrower topics such as the benefits of horticulture and its effects on reducing criminal activity.

Purpose Statement

The purpose of this study was to determine the differences in numbers of recidivism of offenders completing community service in horticultural environments versus those completing community service in non-horticultural environments.

Hypothesis

Community service clients who work in horticulturally-oriented environments are less likely to reoffend when compared to community service clients who work in an indoor or non-horticulturally oriented environments.

Objectives

The specific objectives of this study were:

1. To investigate the types of community service options available for offenders in Hays County, Texas.
2. To investigate the recidivism numbers of offenders assigned community service in a horticultural environment.
3. To investigate the recidivism numbers of offenders assigned community service in a non-horticultural environment.
4. To compare differences in recidivism numbers of those offenders assigned horticultural work versus those assigned other types of community service work such as non-horticultural indoor or non-horticultural outdoor work.
5. To compare offenders, based on demographics, to observe whether any particular demographic group benefits more from completing their community service in horticultural environments.
6. To compare offenders, based on types of crimes committed, to observe whether those who have committed misdemeanors and those who have committed felonies benefit more from serving community service in horticultural environments.

Definition of Terms

Faith-Based Therapeutic Community- “Has a foundation in the therapeutic community model but incorporates a biblical curriculum that reinforces the reliance on a higher power and acceptance of religious teaching to maintain sobriety, make life changes, and more strongly connect offenders to local churches and religion” (Scott et al., 2010, p. 40).

Felony- “One of several grave crimes, such as murder, rape, or burglary, punishable by a more stringent sentence than that given for a misdemeanor” (The American Heritage Dictionary, 2003, ¶ 1).

Horticulture- “Horticulture encompasses all aspects of the intensive cultivation of plants in a relatively limited space. This includes greenhouse culture, vegetable gardening, tree and shrub maintenance, and indoor gardening” (Relf, 1981, p. 55).

Jail- “Jails generally house inmates serving sentences for less than one year, and are usually operated by local governments” (Schmitt et al., 2010, p. 3).

Misdemeanor- “A criminal offense that is less serious than a felony and generally punishable by a fine, a jail term of up to a year, or both” (The American Heritage Dictionary, 2003, ¶ 1).

Non-horticultural community service- “Refers to community services options that do not involve working directly with horticulture and or nature” (Castillo, 2012).

Prison- “Prisons generally house inmates serving sentences of at least one year, and are usually operated by the federal or state governments” (Schmitt et al., 2010, p. 3).

Probation- “The act of suspending the sentence of a person convicted of a criminal offense and granting that person provisional freedom on the promise of good behavior” (The American Heritage Dictionary, 2003, ¶ 1).

Offender- “One that offends, especially one that breaks a public law” (The American Heritage Dictionary, 2003, ¶ 1).

Recidivism- “The repeating of or returning to criminal behavior by the same offender or type of offender” (American Heritage Dictionary, 2012, ¶ 1).

Rehabilitation- “The restoration of someone to a useful place in society” (Princeton

University, 2003-2012, ¶ 1).

Therapeutic community- “Specially structured mental hospital or community health center that provides an effective environment for behavioral changes in patients through resocialization and rehabilitation” (Medical Dictionary for the Health Professions and Nursing, 2012, ¶ 1).

Therapy- “Treatment of illness or disability” (The American Heritage Dictionary, 2003, ¶ 1).

Limitations

The limitations of this study include the following:

1. Any research conducted with humans will have extraneous variables that could have influenced the outcomes of the study.
2. Non-experimental research that is based on “real-life” scenarios cannot completely compensate for all controls.
3. The sample population for this study came from a single county in Texas, and therefore cannot necessarily be generalized to all counties in Texas.

Assumptions

1. It was assumed that complete information from counties was provided.

II. REVIEW OF LITERATURE

The United States currently incarcerates the greatest percentage of its population when compared to any other nation in the world, with Texas housing the second largest prison population in the country (CEPR, 2010; Carson, 2015). With such inflated prison populations and growth rates, this increase reflects a number of growing concerns regarding recidivism (Mears et al., 2012). Between 2012 and 2013 federal prison populations saw an overall 0.4% increase in size (Carson, 2015). However, by the end of 2014, prison populations were the smallest they had been since 2005, demonstrating the second greatest decline in over 35 years, but with the largest female prisoner population since 2009 (Carson, 2015).

Distinguishing between those who commit violent crimes and those who commit non-violent crimes continues to be a topic among researchers for explanations in recidivism numbers. Nonviolent offenders make up more than half of those who are serving time behind bars and this increase in incarceration is currently being explained by harsher sentencing policies rather than exacerbated levels of criminal activity (Center for Economic and Policy Research, 2010). According to the Center for Economic and Policy Research (CEPR), in 2008, over 60% of prison and jail populations were made up of non-violent offenders (Schmitt et al., 2010). In 2012, CEPR reported that non-violent offenders, such as drug offenders, accounted for nearly one-fourth of those incarcerated. The Bureau of Justice Statistics (BJS) reported in 2014 that half of all males incarcerated and nearly 60% of all females incarcerated were serving federal time for drug related offenses (Carson).

Cost of Crime on Society

The significant impact of increased prison and jail populations on society has been debated for years and continues to be a point of interest for many researchers (Rice and Remy, 1994). The total cost of housing a single inmate averages \$31,286 annually (Henrichson and Delany, 2012). Schmitt et al. (2010) reported budgetary costs totaling \$75 billion in 2008, with federal, state and local governments focusing large portions of their spending on incarceration. Offenders, victims, their families, and the community feel the impact of criminal activity and incarceration (Bloom and Steinhart, 1993; Clear, 2007), even though “the ‘costs’ of criminal activity [generally] fall[s] on an individual, or small group of individuals, rather than on society” as a whole (Albertson and Fox, 2011, p. 46). According to Barreras et al. (2005) “incarceration impacts the life of a family in several important ways: it strains them financially, disrupts parental bonds, separates spouses, places severe stress on the remaining caregivers, leads to a loss of discipline in the household, and to feelings of shame, stigma, and anger” (Henrichson and Delany, 2012, p. 3). The widespread damaging effects on communities can be seen when new “social norms” develop within the community in order to cope with the revolving door of crime (Roberts, 2004, p. 1296). For example, when locked away, inmates are unable to provide for their families, and this loss of income directly affects the overall structure and foundation of the family unit, as well as a parent’s ability to devote proper attention to their offspring, which is necessary for healthy childhood development and welfare of the community (Rice and Remy, 1994).

DeLisi (2001) discusses how the aftermath of criminal activity can be displayed through the inhibition of pro-social development; in turn, greatly jeopardizing a society’s

ability to move forward and progress collectively as a whole. This inhibition of growth within social networks, and a community's ability to effectively utilize resources that defend against corrupt policies and promote social change, greatly impacts a society's social norms and is one of many sociological theories behind prison policy (Roberts, 2004). According to Roberts (2004, p. 1296), considering the social norm of a particular community could "explain the harmful social influence [of] mass incarceration on the broader public."

Not only does this inability for inmates to provide for their families once behind bars affect contributions made within the home, but inmates are also no longer able to make contributions within the workforce. Schmitt et al. (2010) found that in 2008 alone, one out of every 48 working-age men, or 2.1% of all working-age men, were incarcerated and being held in either prison or jail. Included in this percentage are fathers who are no longer able to provide much needed financial support for their families, as well as single fathers who are no longer able to provide much needed child support for single mothers (Chung, 2011).

Why Do Criminals Reoffend?

"What an inmate perceives or is able to perceive in his [or her] environment" is known to shape their experiences and decisions (Rice and Remy, 1994, pg. 205), suggesting individuals commit crimes for a variety of reasons (Roberts, 2004). Therefore, distinguishing the differences between habitual offenders who blatantly and continually participate in illegal activities, from offenders who cease to participate in illegal activities after a short period of time, is important when looking at an offender's alleged offense (Broadhurst, 2000).

The social norm theory theorizes how “criminal behavior is shaped by an individuals’ perception of their neighbors’ values, beliefs, and conduct” (Roberts, 2004, p. 1286). On the other hand, according to social scientists that support the classical thinking of the rational choice theory (a theory that Beccaria (1764) accredits “pleasure and pain” as motivating factors for influencing the actions of conscious individuals), individuals assume “self-interest” as their driving factor (Albertson and Fox, 2011, p. 63). For example, demographics, socio-economic restraints, and “the effects of both age and gender on criminal behavior are well known” and are factors to consider when looking at an individual offense and rationale behind committing a crime (Albertson and Fox, 2011, p. 51). Solvic (1966) reports males display more of an inclination toward conducting risky behavior than females, while Albertson and Fox (2011) also report juvenile males are more likely to commit crimes when compared to any other population.

In 2010, Sickmund reported over 80,000 juveniles were arrested and locked up for crimes and offenses they had committed. For juveniles, lack of opportunities within their immediate and surrounding communities create obstacles that ultimately influence their likelihood for reoffending. Even though this period of deviancy can ultimately lead to further criminal activity, the majority of deviant behavior is likely to be outgrown by late adolescence (DeLisi, 2001). For these young offenders, such high recidivism numbers of up to 50 and 80% reflects the growing demand for effective rehabilitation programs; once behind bars youth are given little, if any, individualized attention or guidance (Ameen and Lee, 2011).

The increase in “incarceration is no longer simply an outcome of neighborhood crime, but [is now an] integrated [part of the] the damaged social fabric of communities

that produce crime” (Roberts, 2004, p. 1297). Devilly et al. (2005, p. 222) reports how the “social inoculation theory emphasizes [how] social pressures contribute to [the] emergence of unhealthy behaviors,” and goes on to further elaborate with Sutherland and Cressey’s (1960) differential association theory that “argues criminal behavior is learned in social situations” as well (p. 221). After conducting independent longitudinal studies of career criminals, both Farrington and Smith discovered in 2007 that “delinquent parents, siblings and peers [are potential influencing] factors that can increase an individual’s propensity to offend” (Albertson and Fox, 2011, p. 54).

Albertson and Fox (2011, p. 53) report that “the presence of others [often tends] to impact an individuals’ decisions,” whether the influence be positive or negative. Negative influences have been reported to increase the likelihood of juveniles engaging in criminal activity when the “skills, techniques, motivations, rationalizations, and attitudes required to engage in a crime” were taught directly from their peers (Devilley et al., 2005, p. 222; Milburn, 1995; Turner and Shepherd, 1999). According to the social inoculation theory, peers often negatively influence and “teach each other ‘bad’ habits” and learned skills (Devilley et al., 2005, p. 222). Researchers Ameen and Lee (2012) found that crimes committed by youth are largely influenced by lack of resources made available within the community, while Freeman and Wise (1982) connect criminal activity to youth unemployment.

Who Commits Crimes and Why?

Moffitt’s (2001) developmental taxonomy theory is used to “predict the most active criminal offenders” (DeLisi, 2001, pg. 78). According to Moffitt’s (2001) developmental taxonomy theory, there are two distinct types of criminals: adolescence-

limited and life-course persistent offenders (DeLisi, 2001). Moffitt (2001) defines adolescence-limited offenders as juvenile offenders who experience a period of delinquent behavior characterized as being brief and brought on by individual difficulties transitioning into adulthood. Of the life course persistent offenders, there are multiple common characteristics of those who remain in the criminal justice system throughout their lives including unemployment status, extended unemployment, unstable residency, presence of physical handicaps, unstable mental health, history of substance abuse, and prior history of repeated run-ins with the law (DeLisi, 2001). However, the majority of criminals are suggested to be benign, low-level offenders (DeLisi, 2001).

Schmitt et al. (2010) reports current evidence “suggests that the higher rates of incarceration have made some contribution to lowering the crime rate, either by acting as a deterrent or by warehousing offenders during the ages in their lives when they are most likely to commit crimes” (p. 9). Research also suggests prison terms increase the “likelihood of property and drug recidivism” (Mears et al., 2012, p. 370). According to MacKain and Messer (2004), recidivism numbers for both adults and juvenile offenders illustrate a revolving door of instability within the criminal justice system, and serves as a constant reminder of the lack of effective rehabilitation programs.

The American Psychiatric Association (2004) reported our nation’s prison system is replacing state hospitals at an ever-increasing rate, and by default, becoming the new mental institutions. In 2005, the U.S. Department of Justice reported more than half of all prisoners and jail inmates suffered from mental health issues (James and Glaze, 2006). Inmates released from prison who suffer from a serious mental illness tend to show a greater likelihood for higher rates of recidivism (Matejkowski and Ostermann, 2015).

Matejkowski and Ostermann (2015) illustrated the necessity for research regarding those who are in authority and who supervise individuals on parole to discover more adequate means for alleviating the risk for continual criminal activity.

Malicious behavior in criminals varies from offender to offender, and these behaviors are often predictors of ongoing criminal activity, and if identified early enough can increase the likelihood that correction of the inappropriate behavior can be achieved (Broadhurst and Maller, 1991). Rice and Remy (1994) found that an absence of considering one's actions prior to committing a deviant act may also be due to factors such as impaired development and lack of inner controls resulting in repeat offenses committed by some offenders.

What Reduces Recidivism?

Identifying behaviors triggering an offender's likelihood of repeating criminal behavior, and being able to identify signs of such behavior early on can lead to potential adjustments in correcting criminal behavior, thus reducing recidivism (Broadhurst and Maller, 1991). Cohen et al. (1991) found lack of education to be a key characteristic when looking at identifying factors that predict recidivism. Broadhurst and Maller (1991) stress the value of foreseeing future indicators and behaviors of high risk offenders prepares professionals for implementing more efficient programs designed to prevent criminal activity.

Bui and Morash (2010) found the effect of weak ties on criminals, known as social contacts and personal networks, avert the inclination and likelihood to reoffend. For females in particular, positive family contacts during and post-incarceration foster integration into the community and reduce recidivism according to researchers (Hairston,

2003; Petersilia, 2003; Waul et al., 2002). However, research showed nearly half of all female offenders were rearrested with nearly 40% returning to prison within three years of being released (Langan and Levin, 2002). Ruddell et al. (2010) demonstrated the transition into life within the community upon release can be made much easier with outside support. The significance of family and friends supporting their loved ones throughout the duration of the sentence by showing up for monthly visitations, writing letters, and consistently maintaining an open line of communication throughout the sentence was also found to decrease the likelihood of the prisoner reoffending upon release (Bales and Mears, 2008).

Multiple studies have reported the significance of successful outreach programs, and the benefits of their ability to influence criminals from committing future acts of crime, while also predicting the chances of both recidivism and relapse (De Leon et al., 2000; Wexler et al., 1990). Researchers report instilling a sense of hope in offenders is important to consider when suggesting potential rehabilitation (Ruddell et al., 2010; Santos, 2006). Another program showing signs of having a positive impact on offender rehabilitation is the prison-based, peer-led program implemented in both juvenile and adult correctional facilities across the country (Devilly et al., 2005). While it is important to have a support system outside the prison, it is also important to eliminate “inmate idleness” inside prison (Ward, 2009, p. 193; Ameen and Lee, 2012). Prison based peer-led programs help educate offenders on issues such as HIV and AIDS, health concerns, “drug and alcohol abuse, sexual assault/offending, prison orientation, and suicide/violence prevention” (Devilly et al., 2005, p. 219). Researchers Devilly et al. (2005) concluded prison-based, peer-led programs have a profoundly positive impact on

inmates and are indeed an asset to the criminal justice system, encouraging inmates to support one another while serving out their sentences.

Needs ranging outside the scope of mental health such as education and individual mentoring can also influence a successful rehabilitation outcome (Ameen and Lee, 2012). The likelihood of a young offender successfully transitioning into a productive member of society upon release can be significantly jeopardized if they have never experienced any previous form of guidance, vocational development, or taken some form of a reading and writing course (Ameen and Lee, 2012). Once a juvenile offender is arrested and serving his/her time behind bars, the lack of available educational opportunities for learning corrective behaviors while in the criminal justice system greatly hinders the likelihood of positive reentry into society, therefore, being labeled as “forever disconnected and criminalized” (Ameen and Lee, 2012, p. 97).

Rehabilitation Program Options

Successful rehabilitation programs help to prepare offenders for life outside of prison while also educating them on how to maintain stable relationships in both intimate and social environments (Rice and Remy, 1994). Rehabilitation programs such as vocational training programs for juveniles, peer-led programs for inmates, therapeutic communities, animal-assisted therapy (AAT), and horticultural therapy, continue to successfully impact offenders post-incarceration (Amen and Lee, 2011; Devilly et al., 2005; Jaspersen, 2010; Söderback et al., 2004).

Relationships developed during the rehabilitation period often have a long and lasting impact on the individual, and can include relationships with non-humans. For example, AAT, where the animal is the key facilitator bridging therapy and treatment,

utilizes cognitive behavioral techniques to facilitate change in a person (Delta Society, 2012). According to research, the sense of responsibility an individual gains from taking care of an animal has been shown to increase self-esteem and is exceptionally rewarding for the individual working with the animal (Jaspersen, 2010).

Programs such as the LifeLine program, a program introduced in 1991 that “provides support for prisoners while they are in custody and as they make their transition to the community,” were started to help lower the recidivism number in offenders serving out life-sentences while taking some of the stress off of transitioning criminals back into the community (Ruddell et al., 2010, p. 325). Offenders serving out life-sentences present a unique obstacle for the judicial system because those who qualify for parole are under supervision of the criminal justice system for the remainder of their lives and, therefore, require much needed support (Ruddell et al., 2010). According to National Parole Board statistics, from 1994 to 2009, the LifeLine program “has contributed to low[er] rates of recidivism” among offenders who make a “successful transition [into] the community” (Ruddell et al., 2010, p. 324).

Researchers Laux et al. (2011) reported that maintaining a steady job and providing for the family upon release from prison encourages female offenders to adhere to the strict guidelines of their probation stay, focusing their attention to staying on track. “As the unemployment rate increases, the opportunity cost of crime falls” (Albertson and Fox, p.49, 2011). Former prisoners often face discrimination within the workplace, making it increasingly difficult to even find work upon release (Becker, 1968). Therefore, finding a meaningful place within the workforce and community does, in fact, have an effect on an individual’s decision to participate in criminal activity (Petersilla,

2003).

Effective rehabilitation impacts not only the offender in a positive manner, but reassures the community that preventative measures are being taken to help deter future criminal activity. Laux et al. (2011) mentions women in the criminal justice system who have children benefit greatly from counseling and emphasized continued education and vocational training, as well as available access to resources like medical care. Ward (2009) stressed the significant impact vocational training programs can have on inmates simply by continuing education to enhance necessary skills for attracting future employers in the workforce. These learned skills and opportunities, in turn, deter offenders from committing future offenses due to the constructive use they are making of their time.

Ameen and Lee (2012) emphasized traditional career theories focusing on factors such as sociopolitical development and the social cognitive theory, both key factors that can potentially influence the success of vocational programs. Community-based vocational programs, such as the Green Brigade horticultural program for juvenile offenders, and the Master Gardener program for adult offenders, have shown to not only improve horticultural knowledge among adults and young people, but also positively affect their environmental attitudes (Cammack et al., 2002a; Migura et al., 1997; Polomski et al., 1997). For juveniles, vocational training is a rehabilitation option that provided new experiences where they can learn and apply the use of practical skills while incarcerated. Vocational programs are successful because they maintain separateness from “traditional prison routines,” as well as providing “follow-up services for inmates when they are released” (Vacca, 2004, p. 299). This productive use of mental and

physical activity builds confidence, creating a purpose and place within the workforce for moving forward into society (Cullen et al., 1997).

Scott et al. (2010) researched the use of a TC (therapeutic community) to reduce substance abuse and help offenders suffering from substance abuse problems. The goal of the TC model is to rehabilitate offenders using a more holistic approach, setting them up for success by influencing lifestyle changes through motivation, self-help, and social learning (Scott et al. 2010). Scott et al. (2010) believed this model lowered the likelihood of recidivism and relapse among those offenders who received treatment. The TC model also addresses the concern of the increasing number of offenders being incarcerated for drug-related offenses (Zajac, 2001).

What is Horticulture?

Horticulture is not limited to gardening and the harvesting of vegetable and fruit crops, but incorporates a variety of skills such as greenhouse labor, landscaping, and indoor gardening (Relf, 1981). Horticulture is defined as “the science or art of cultivating fruits, vegetables, flowers, or ornamental plants” (American Heritage Dictionary, 2011, ¶ 1). The benefits of interactions with nature and active involvement with horticulture date back in history to the Native Americans who praised the blessings bestowed upon them from the natural environment (Lohr and Relf, 2000). The cultivation of gardens and food crops was not just a means of survival, but was a religious and sacred part of their culture (Buchanan, 1997). Cultures such as ancient Egyptian civilizations were “shown to be the source of much of the agricultural technology of the Western world [...] continuously incorporat[ing] technology as well as new crops” into the advancement of their crops (Janick, 2000, p. 23). Through the fine-tuned engineering of “basic tools of agricultural

[such as] the ax, the hoe, and the plow,” Egyptian’s mastered the art of advancing in agriculture field (Janick, 2000, p. 28).

What is Horticultural Therapy?

Horticultural therapy (HT), utilizing the cultivation of plants as part of a strategy for personal change, significantly influenced successful outcomes among rehabilitation programs (Sandel, 2004). Gardening has long been used for its therapeutic benefits and really began taking flight in American hospitals, institutions, and reformatories in the early 20th century (Grossman, 1979). In fact, “many hospitals today include gardens and therapeutic programs using plants as part of their treatment plans” (Lohr and Pearson-Mims, 2000, p. 53). Söderback et al. (2004) suggested the very fact that humans naturally seek protection, comfort, and tranquility where there is nature and water to be found is a great cause for research into the healing benefits of working in nature. For example, “implementing generationally appropriate activities for persons with dementia is [often times] a challenging task. HT addresses this challenge through the use of plants to facilitate holistic outcomes” (Gigliotti and Jarrott, 2005, p. 367). Gigliotti and Jarrott (2005) also found that “despite cognitive limitations” adults suffering from dementia who participated in HT activities displayed “higher levels of productive engagement and positive affect and lower levels of non-engagement” when compared to adults suffering from dementia who participated in “traditional” adult day service activities (p. 367).

A community-based horticultural program called The Green Brigade was designed specifically for the rehabilitation of juvenile offenders (Cammack et al., 2002b). Cammack et al. (2002b) found those who participated in “activities involv[ing] plant materials, displayed more positive interpersonal relationships scores” than those who

participated in “all male sessions where the hands-on activities focused on the installation of hardscape materials and lack of plant materials” (p. 12). Not only did the Green Brigade program significantly improve horticultural knowledge among “juvenile offenders who actively participated in the program,” but researchers, Cammack et al. (2002a), also found “participants attending the Green Brigade program less than 60% of the time” expressed a significantly more negative attitude towards the environment than participants who routinely participated in the program (p. 77).

Benefits of Passive vs. Active Interactions with Plants

Passive interactions with plants, such as the study of plants within the workplace, and classroom have drawn much attention to researchers interested in the effects of plants on our environment. Researchers Thomsen, et al. (2011) found the benefits of passive interactions with plants in their results linking decorative plants within the office environment to employees’ enhanced perceptions of the workplace and genuine social interactions among co-workers. The presence of plants within the work environment was also a contributing factor to the reduction of physical discomfort triggers (Fjeld, 2000; Fjeld et al., 1998). Ulrich and Parsons (1992) reported on the benefits photographs containing plants had on individuals in what they referred to as “passive situations” and the positive effects plants have on people. Researchers Dravigne et al. (2008) later supported these benefits; their findings indicated those “who worked in offices with plants and windows reported they felt better about their job and the work they performed” (p. 183). Those employees who had access to views of either windows or interior plants also reported a higher overall quality-of-life (Dravigne et al., 2008).

Research further expanding upon the notion of plants and their positive impact on

an individual's environment is supported by Doxey et al. (2009) who studied the influence of interior plants on university students in a classroom setting. Doxey et al. (2009) found statistically significant differences indicating a more positive view of individual courses and classrooms when the "overall course and instructor evaluation scores of treatment and control groups" were compared (p. 384). Results showed classrooms which were "windowless," "stark," and "void of [any] other natural elements" were impacted the greatest by the presence of interior plants (Doxey et al., 2009, p. 384). Classroom evaluations found statistically significant differences between students who were exposed to plants versus students who were not exposed to plants in "learning, enthusiasm (of instructor), and organization (of instructor)" (Doxey et al., 2009, p. 384).

The presence of plants are beneficial in mediating patient/client dysfunction (Mattson, 1992, p. 184). It is not uncommon to find patients in a hospital unsettled and wishing they were outside or any place other than confined to their room or bed. Ulrich (1983) conducted a well-known study documenting the pain reducing and tranquil effects windows with a view of nature had on patients versus windows with a view of another building. According to the study, patients with views of trees, gardens, and nature who had undergone surgery received fewer pain-reducing medications when compared to patients who had a view of a building or non-nature scene (Ulrich, 1983). Plants and community gardens/green spaces help to improve the health and quality of life of hospital patients while positively impacting how they view their quality of life (Park and Mattson, 2009). For example, McFarland et al. (2010) found the environment of a university campus and how its design, in particular, directly "influence[s] the degree of stress students may" experience (p. 186)." Passive interactions with greater levels of greenery

and landscaping reduced performance anxiety and resulted in better performance from all competing collegiate athletes (Matthews and Waliczek, 2010).

Influences of Interactions with Plants

For many prisoners their time spent behind bars is anything but pleasant. Any opportunity granted where they are provided a safe space to get away from the unsparing and merciless threats of other inmates is welcomed; horticultural programs offer this (Rice and Remy, 1994). The close proximity of humans working with plants and nature creates a bond individuals are able to independently cultivate as a result of positive distractions from surrounding horticulture (Ulrich, 1992). The maintenance required to keep plants alive, vibrant and healthy requires care and acute attention to detail. This acute attention to detail in many instances can trigger memories outside of the plant-human relationship (Knight, 1993).

For example, Relf (1981) expands upon the process of uprooting and transplanting plants and vegetables as a means of relating life experiences to the gardening experience. In order to transplant and uproot properly, a person should be mindful of the condition of the plants and crops and careful with the handling process, both similar to maintaining and caring for relationships with friends, family, co-workers, and acquaintances. The extracting and uprooting of plants can also relieve stress, as if pulling out the old and clearing room for the new (DeWolfe et al., 2011). Learning different means for controlling unsettled emotions and intense feelings can help to establish new methods of coping with life and also help gain new insight into self-control (Relf, 1981).

For instance, Waliczek et al. (2005) conducted a survey used to research the

overall perceptions of life satisfaction among both gardeners and nongardeners. Based on the information collected, individuals who actively participated in gardening activities responded more positively to survey questions while showing a significant increase in “energy levels, optimism, zest for life, and physical self-concept” (Waliczek et al., 2005, p. 1360). Gardeners also scored higher in overall health and physical activity, indicating an increase in their self-esteem, pride, and self-actualization (Waliczek et al., 2005).

As a means of vocational rehabilitation, the advantages to working in a horticultural environment include its ability to reach a wide range of individuals from criminals, to the mentally ill, to individuals with physical disabilities. The benefits of interacting with our natural environment reflect personal characteristics such as self-confidence and increased morale, and encouraging the progression of life (Relf, 1981). The relationship one develops with others and their immediate surroundings encourages the continued progress of their rehabilitation, and a natural response when working with plants and the natural environment is to adapt to the constantly changing environmental needs of plants. Given adequate attention and the proper amount of care, plants will thrive and flourish, returning positive feedback to the individual caretaker (Relf, 1981). This feeling of accomplishment and knowing they have provided adequate care in order for the plants to grow gives a sense of meaning and purpose to those normally exposed to the harsh realities of the world reacting to their immediately identifiable handicaps and disabilities (Relf, 1981).

Horticulture in Job Training

Working in a horticultural environment presents new possibilities for individuals presented with unique handicaps to advance their skill level whatever it may be (Relf,

1981). Relf (1981) reported the fundamentals of horticulture, and how the required educational components often resulted in the mastering of what is referred to as new concepts, literary jargon, and improved communication skills, all of which benefit the individual working firsthand with horticulture in multiple aspects of their lives. Skills learned while working in a horticultural environment can range from labor-intensive vocational work to establishing social and critical thinking skills necessary for collaborating on potential landscaping designs or within a greenhouse environment (Haller, 1998).

Detention facilities across the U.S. utilize horticultural programs in rehabilitation (Rice and Remy, 1994). Many prisoners participate in horticultural activities such as harvesting and maintaining their own vegetable gardens as a means of providing food for themselves, which are also used later as a successful means of earning income for the prisons (Lewis, 1996). Even though the work necessary to maintain the garden projects was mandatory and required by the prisons, Pudup (2007) points out the significance of such well-structured horticultural activities, and the huge role they play in influencing a self-regulating and organized lifestyle for the inmates.

Horticulture programs within our nation's correctional facilities provide necessary skills for acquiring jobs outside of life behind bars. In 1991, a South Carolina prison adopted their first prison-based Master Gardener (MG) program, a program designed for inmates not only to acquire horticultural skills, but also to earn hours to potentially become certified and accredited MGs (Polomski et al., 1997). Since 1991, many prisons across the country have replicated South Carolina's Master Gardener study and adopted the program into their facilities, allowing select inmates the opportunity to become

proficient in horticultural skills and increasing their chances of potential job opportunities once released. Not only are the horticultural skills learned of benefit to the inmate and prospective employers, but completing the program gave inmates a sense of self-worth and provided meaning to their lives while incarcerated; the program also stimulated a continued attraction in the field of horticulture (Polomski et al., 1997).

In 1997, a quantitative evaluation of horticulture vocational-therapy programs was conducted by Migura et al. (1997) to assess the self-development of female inmates and found that self-esteem and global life satisfaction significantly increased in those inmates who participated in the Master Gardener program. Migura et al. (1997) also found substance abusers showed statistically significant increases in their “situation specific internal-external locus of control and their global life satisfaction while participating in the Master Gardener program” (p. 299). Migura et al. (1997) additionally found that the Master Gardener program “significantly increased their [overall] self-esteem” (p. 299) of female inmates.

Organized horticultural activities provide numerous opportunities for independent growth among inmates by teaching new skills that will assist them with reintegrating back into life outside of prison (Migura et al., 1997; Lindemuth, 2011). When applied, these skills can greatly decrease the likelihood of reoffending while educating offenders on multiple outlooks and various approaches for analyzing the perception of their own personal quality of life (Migura et al., 1997).

III. METHODOLOGY

The purpose of this study was to determine the differences in numbers of recidivism of offenders completing community service in horticultural environments versus those completing community service in non-horticultural environments.

Recidivism Data

Data were collected through obtaining offender profile probation revocation reports, agency records, and community service supervision reports from the Hays County Adult Probation Office in San Marcos, Texas. The official documents presented information on individuals and their alleged and convicted offenses. These offenses ranged from misdemeanors to felonies committed within Hays County between the dates of January 1, 2007 and September 19, 2012.

Personal information provided from agencies regarding the offenders included gender, ethnicity, age and degree of offense committed. The information also included number of community service hours completed per each offender, per each agency and whether the offender showed any incidence of recidivism.

Information on the types of community service activities in which clients participated was also collected through the Hays County Adult Probation Office. Respective agencies detailed the types of activities in which clients were involved; these forms were provided to researchers and then evaluated in order to code each type of service as being horticultural, non-horticultural indoor or non-horticultural outdoor work. Some clients did not complete community service and were coded as “no community service.” Such clients could have committed an offense where community service hours were not required or posed as an option for resolution.

Sample Population

This sample population included both non-violent and violent offenders classified by degree of offense committed: misdemeanor A, misdemeanor B, misdemeanor C, felony 1, felony 2, felony 3, felony 4 and state felony.

The Texas Penal Code defined both misdemeanors and felonies under Title 3, Punishments, Chapter 12, Punishments, Subchapter A, General Provisions. According to the Texas Penal Code, “misdemeanors are classified according to relative seriousness of the offense [and are divided] into three categories, [...] and conviction of a misdemeanor does not impose legal disability or disadvantage” (Sec. 12.03, 1994). “Class A misdemeanors shall be punished by: a fine not to exceed \$4,000, confinement in jail for a term not to exceed one year, or both such fine and confinement,” Class B misdemeanors included a fine not to exceed \$2,000, confinement in jail for 180 days, or both a fine and jail time. Lastly, Class C misdemeanors require paying a fine up to \$500.

Felonies are also classified in the Texas Penal Code into 5 categories “according to the relative seriousness of the offense” (Sec. 12.04, 1994). In Texas, a capital felony carries the maximum sentence of the death penalty if sought by the state, but if the state does not seek the death penalty, a capital felony carries a minimum sentence of life without the possibility of parole (Sec. 12.31, 1994). “An individual guilty of a felony of the first degree shall be punished by imprisonment for life or for any term of not more than 99 years or less than five years” (Tex. Penal Code, 1994). Those guilty of second degree felonies will serve a prison term of not more than 20 years or less than 2 years; those guilty of third degree felonies will serve prison time of 2 to 10 years (Tex. Penal Code, 1994). Those charged with state jail felonies will serve time in a state jail for 180

days to 2 years; an individual guilty of a state jail felony will be charged for a third degree felony if proven in a court of law a deadly weapon was used or if the individual has had any prior felony charges (Tex. Penal Code, 1994). “In addition to imprisonment, an individual guilty of a felony of the [first, second, third degree, or state jail] may be punished by a fine of up to \$10,000” (Tex. Penal Code, 1994).

Data Sorting and Organization

Information gathered from offender revocation reports and agency records were sorted and coded manually into Microsoft Excel (Seattle, WA). In order to protect client anonymity, personal information such as first and last names were not collected; the information and data points regarding each client’s case number, gender, ethnicity, age and degree of offense committed were identified and coded accordingly.

Data Collection

Over 20,000 case numbers were collected from the Hays County Adult Probation Office. The clients’ original case numbers were used for labeling and organizational purposes and a random sample of 477 total cases were selected for further data analysis. This number was considered suitable to be representative of the overall population given the recommendations by Krejcie and Morgan (1970).

From the original sample population of over 20,000 case ID numbers, 477 individual case numbers were randomly selected. The 477 case numbers were then individually cross referenced with the original database of information using Microsoft Excel (Seattle, WA) to identify and match for each case the total community service hours completed at a community service agency, the type of community service conducted and if the community service program was in a horticultural setting, non-

horticultural indoor setting, non-horticultural outdoor setting or if there was no community service served.

Data Analysis

Data were analyzed using SPSS (Statistical Package for the Social Sciences 20.0) (Armonk, NY). Frequency, descriptive statistics and analysis of variance tests were conducted to analyze data and compare the recidivism numbers between horticulture and non-horticulture community service and indoor versus outdoor community service. Comparisons were made to evaluate if differences occurred between offenders of different genders, ethnicity, age and degree of offense committed.

IV. RESULTS

The main objective for this study was to determine if incidence of recidivism was lower among offenders who completed their community service hours in horticultural environments versus offenders who completed their community service hours in non-horticultural environments.

The specific objectives of this study were:

1. To investigate the types of community service options available for offenders in Hays County, Texas.
2. To investigate the recidivism numbers of offenders assigned community service in a horticultural environment.
3. To investigate the recidivism numbers of offenders assigned community service in a non-horticultural environment.
4. To compare differences in recidivism numbers of those offenders assigned horticultural work versus those assigned other types of community service work such as non-horticultural indoor or non-horticultural outdoor work.
5. To compare offenders, based on demographics, to observe whether any particular demographic group benefits more from completing their community service in horticultural environments.
6. To compare offenders, based on types of crimes committed, to observe whether those who have committed misdemeanors and those who have committed felonies benefit more from serving community service in horticultural environments.

Findings Related to Objective One

The first objective was to investigate which community service options were available in each of the following categories: horticultural community service, non-horticultural indoor community service and non-horticultural outdoor community service. In Hays County, Texas, there were 52 different agencies available as options for community service during the time of the study. Examples of horticultural community service included grounds maintenance opportunities. Non-horticultural community service options included indoor work such as technical, janitorial, semi-technical and clerical work. Non-horticultural outdoor community service opportunities included jobs such as construction and general labor. Out of the 52 community service agencies, 49% (25) provided horticultural work options, 42% (22) provided non-horticultural indoor work options and 9% (5) provided non-horticultural outdoor work options. In classifying sites as horticultural, non-horticultural indoor or non-horticultural outdoor, if the site included any type of horticultural work, among other work, the site was classified as a horticulturally related work environment (Table 1).

Table 1: Compilation of information regarding community service agencies, the type of service provided by each agency and how they were coded for the study.

Community Service Agency	Type of service provided by agency	Study service code ^Z
AE Woods Fish Hatchery	General Labor, Construction, Grounds Maintenance	3

All-Texas Athletic Center, Inc.	Semi-Tech, Janitorial, Construction, General Labor	1
Always Wanted a Riding Experience (AWARE)	Technical, General Labor, Construction, Janitorial, Clerical, Semi-Technical	1
Capital Area Rural Transportation	Janitorial, Grounds Maintenance	3
Christian Federation of Police Officers Youth Sports	General Labor, Grounds Maintenance	3
Citizen's Collection Station	Technical, General Labor, Janitorial, Clerical	2
City of Dripping Springs	General Labor	2
City of Kyle Parks and Recreation	General Labor, Construction, Janitorial, Grounds Maintenance	3
City Parks and Recreation	General Labor, Construction, Janitorial, Grounds Maintenance	3
Combined Community Action	General Labor	2
Development Services	Clerical	2
Dripping Springs Chamber of Commerce	General Labor, Clerical	2
Dripping Springs Community Library	Construction, Grounds Maintenance	3

Dripping Springs Youth Sports Association	General Labor, Grounds Maintenance	3
Emily Ann Theater	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
First Baptist Church of Noah's Ark	Technical, General Labor, Clerical	2
Food Bank	Technical, General Labor, Clerical	2
Freedom House	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
Goodwill Industries of Central Texas	General Labor, Janitorial	2
Grace Food Pantry	General Labor, Construction, Janitorial, Grounds Maintenance	3
Hays Caldwell Council	Technical, General Labor, Construction, Janitorial, Semi-Technical, Clerical	1
Hays CISD Even Start Program	General Labor, Janitorial, Grounds Maintenance	3
Hays County Auditor's Office	Technical, Semi-Technical, Clerical	2
Hays County Civic Center	General Labor, Janitorial, Grounds Maintenance	3

Hays County Clerk's Office	Clerical	2
Hays County Community Service and Corrections Department	Janitorial, Clerical	2
Hays County Courthouse	Clerical	2
Hays County Human Resources Department	Clerical	2
Hays County Parks and Recreation	General Labor, Grounds Maintenance	3
Hays County Treasurer's Office	Clerical	2
Hays County Women Center	General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
Hays Youth Soccer Association	General Labor, Janitorial, Grounds Maintenance	3
Human Resources Department	Clerical	2
Kyle Community Library	Clerical	2
Kyle Housing Authority	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
Kyle Probation Department	General Labor, Janitorial, Grounds Maintenance	3

Kyle Parks and Recreation	General Labor, Janitorial, Grounds Maintenance	3
Mutt Strutt	General Labor, Clerical	2
North Hays County Optimist Club	General Labor	2
PAWS Shelter and Humane Society	General Labor	2
Redwood Baptist Mission	General Labor, Grounds Maintenance	3
Salvation Army	General Labor, Clerical	2
San Marcos Animal Shelter	General Labor, Janitorial, Clerical, Grounds Maintenance	3
San Marcos Area Food Bank	Technical, General Labor, Construction, Janitorial, Semi-Technical, Clerical	1
San Marcos CISD	Grounds Maintenance	3
San Marcos CISD Transportation	General Labor, Janitorial	2
San Marcos Housing Authority	Technical, General Labor, Construction, Janitorial, Semi-Technical, Clerical	1
San Marcos Marshall's Office	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
San Marcos Parks and Recreation	General Labor, Janitorial, Grounds Maintenance	3

San Marcos Police Department	Grounds Maintenance	3
San Marcos Public Library	General Labor, Janitorial, Clerical	2
San Marcos Senior Citizen's Center	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
Southside Community Center	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
Texas Workforce Center	Janitorial	2
Texas State University Horticultural Program	General Labor, Construction, Grounds Maintenance	3
The Mitchell Center	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
U.S. Fish and Wildlife Service	Technical, General Labor, Janitorial, Grounds Maintenance	3
Village Store	General Labor, Janitorial	2
Wimberley Chamber of Commerce	General Labor, Janitorial, Grounds Maintenance	3
Wimberley Baseball Little League	General Labor, Janitorial, Grounds Maintenance	3
Wimberley Justice of Peace Office	General Labor, Janitorial, Grounds Maintenance	3

Wimberley Lions Club	General Labor, Grounds Maintenance, Clerical	3
Wimberley Senior Center	General Labor, Construction, Janitorial, Grounds Maintenance	3
Wimberley Valley Watershed Association	Technical, General Labor, Construction, Janitorial, Semi-Technical, Grounds Maintenance, Clerical	3
Wimberley Veteran of Foreign Wars Post 3413 and 6441	General Labor, Janitorial	2

^zCommunity service was coded as: 1 = non-horticultural outdoor, 2 = non-horticultural indoor; 3 = horticultural work.

Findings Related to Objective Two

The second objective was to investigate the recidivism numbers of offenders assigned community service in a horticultural environment. Upon investigating a stratified sample of 477 reports, a total of 58.1% (277) clients completed their community service hours in a horticultural environment. Out of the 277 clients, 15 incidents of recidivism were reported at 5.4% among offenders who completed their community service hours in a horticultural environment. The average rate of recidivism amongst all reported offenders of this population sample, including those who were not allowed the opportunity to do community service, was 18% (86). When compared to the incidence of recidivism as a whole in the U.S., these rates of recidivism are relatively low. For example, according to the 2005 Bureau of Justice Statistics (BJS) report, 67.8% of offenders were rearrested within three years of being released, and 76.6% of offenders

were rearrested within five years of being released.

Findings Related to Objective Three

The third objective was to investigate the recidivism numbers of offenders assigned community service in non-horticultural indoor and non-horticultural outdoor community service environments. A total of 147 clients completed their community service in non-horticultural indoor and non-horticultural outdoor environments. The 92 clients participating in non-horticultural indoor community service work showed 14.1% (13) recidivism. The 55 clients participating in non-horticultural outdoor community service showed 9.1% (5) recidivism.

Recidivism rates were 5% higher among those who served out their community service hours in non-horticultural indoor environments compared to those who served their community service in non-horticultural outdoor environments. These findings illustrate those who were assigned community service in a non-horticultural outdoor environment showed less recidivism when compared to those who completed their community service in a non-horticultural indoor environment. Both samples had recidivism levels below the norm for the U.S. In 2005 the U.S. reported 35% of offenders amongst those released on probation and/or parole were rearrested within 3 years after their initial release date (Markman et al., 2016). In 2005, 43% of offenders were rearrested within 5 years of being placed on community service (Markman et al., 2016).

Researchers found clients who spent their time outdoors and/or with plants and flowers experienced positive psychological benefits (Waliczek et al., 1996). Others found that spending time in outdoor environments benefited both children and young

adults through the development of socializing and interpersonal relationship skills (Dressner and Gill, 1994; Shields et al., 1985). Bui and Morash (2010) found the effect of weak ties on criminals, known as social contacts and personal networks, avert the inclination and likelihood to reoffend.

Improved socialization is also a common goal of horticultural therapy (Waliczek and Zajicek, 2016). For example, programs such as Outward Bound and the Green Brigade horticultural program, which are focused towards adolescents, target socializing youth through various outdoor activities and adventures (Neill, 2003; Williams, 2000; Cammack et al., 2002b). Socialization provided offenders a way to connect with their peers; it is these interpersonal skills coupled with time spent outdoors (Dressner and Gill, 1994; Shields et al., 1985; Waliczek et al., 1996; Cammack et al., 2002b) that may potentially help with reduction in rates of recidivism. Previous research citing horticultural programs used for vocational training and rehabilitation yielded positive results indicating reduced crime within the community, beautification of surrounding areas and psychological components with respects to behavior modification (Cammack et al., 2001; Cammack et al., 2002b; Flagler, 1995; Pope et al., 1988).

Findings Related to Objective Four

The fourth objective was to compare differences in recidivism numbers of those offenders assigned horticultural work versus those assigned other types of community service work such as non-horticultural indoor or non-horticultural outdoor work and/or those not allowed the opportunity to do community service. Results of an ANOVA test indicated statistically significant differences in comparisons of the four groups (Table 2).

Table 2: ANOVA comparisons to determine the differences in numbers of recidivism of offenders completing no community service, community service in horticultural settings and in other types of settings.

Community service groups	Incidents of recidivism			df	F	P
	(no./%)	Mean ^Z	SD			
No community service	53.00/100.00%	1.00	0.000	3	214.11	0.000*
Non-horticultural outdoor	5.00/09.10%	1.91	0.290			
Non-horticultural indoor	13.00/14.10%	1.86	0.350			
Horticultural	15.00/05.40%	1.95	0.227			

*Statistically significant at $P \leq 0.05$.

^Z The clients were coded as “1” if they reoffended and “2” if they did not reoffend.

Post-hoc tests (LSD) showed that there were no differences in incidences of recidivism between those serving in non-horticultural outdoor and horticultural environments. However, horticultural and outdoor community service resulted in less recidivism when compared to those doing indoor community service (Table 3). “Horticulture programs are commonly used in the vocational training and rehabilitation of adult prisoners” (Flager, 1995; Cammack et al., 2002b, p. 82). Researchers Mohammed and Mohamed (2015) found individuals who engaged in vocational and/or educational programming had lower rates of recidivism when compared to those who did not engage or enroll in programming. Participation in vocational and/or educational programs provided inmates the opportunity for learning how to read, write and develop the skills necessary for a healthy and successful transition back into their communities and society (Mohammad and Mohamed, 2015). The likelihood of a young offender

successfully transitioning into a productive member of society upon release can be significantly jeopardized if they have never experienced any previous form of guidance, vocational development, or taken some form of a reading and writing course (Ameen and Lee, 2012). Therefore, finding a meaningful place within the workforce and community does, in fact, have an effect on an individual’s decision to participate in criminal activity (Petersilla, 2003).

These findings also support previous research reporting that spending time in outdoor environments has beneficial effects (Dressner and Gill, 1994; Shields et al., 1985; Waliczek et al., 1996). For example, spending time outdoors has been shown to reduce stress levels (Ulrich, 1983; Kaplan, 1995), enhance interpersonal relationships and socialization skills (Dressner and Gill, 1994; Shields et al., 1985; Waliczek et al., 1996; Cammack et al., 2002b). These benefits coupled with cognitive rehabilitation and growth could also be influencing the particular sample of offenders on probation being reported on in this study. Researchers Cammack et al. (2002b) reported how “past evaluations of adult programming indicate that the incorporation of horticulture into juvenile offender probation programming may have some positive effects on participants’ behaviors” as well (p. 82).

Table 3: Post hoc analysis (LSD) indicating the differences between community service groups completing community service in horticultural settings versus other types of settings.

Community Service		N	Mean	P
Horticultural	No community service	53	0.946	0.000*
	Non-horticultural outdoor	55	0.037	0.322

Non-horticultural indoor	92	0.087	0.004*
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*Statistically significant at $P \leq 0.05$.

In terms of reducing recidivism, Kransy and Khatib (2015) found individuals with a sustained commitment to a horticultural program upon being released from incarceration experienced a smoother and more fluid transition back into society as a whole while significantly lowered rates of recidivism as well (Jenkins, 2016). Researchers report instilling a sense of hope in offenders is important to consider when suggesting potential rehabilitation (Ruddell et al., 2010; Santos, 2006).

Findings Related to Objective Five

The fifth objective was to compare offenders, based on demographics, to observe whether any particular demographic group benefited more from completing their community service in horticultural environments. Demographic comparisons were made between those serving out community service in non-horticultural outdoor, non-horticultural indoor and horticultural community service work environments. Descriptive statistics were used to indicate the types of settings in which the offenders chose or were assigned to work (Table 3). The distribution of community service assignments does not directly represent the nationwide distribution of assignments, or the distribution of assignments in Texas as a whole. However, the demographic distribution of the sample community service assignments was similar to Hays County as a whole. According to the United States Census Bureau, the estimated population size of Hays County in July of 2015 was 194,739. With regards to demographic distribution in Hays County, 50.2% were female, 49.8% were male, 23% were under the age of 18, 10.3% were 65 years of age or older, 55.5% were Caucasian alone, not Hispanic or Latino, 4.2%

were African American, 1.2% were American Indian or Alaskan Native, and 37.6% were reported Hispanic or Latino (United States Census Bureau, 2015).

Table 4: Demographic breakdown of study participants completing community service in horticultural settings, non-horticultural outdoor settings, non-horticultural indoor settings versus those who completed no community service.

	Non- horticultural outdoor (no./%)	Non- horticultural indoor (no./%)	Horticultural (no./%)	No community service (no./%)
GENDER				
Male	65.00 / 70.70%	42.00 / 76.40%	229.00 / 82.70%	36.00 / 67.90%
Female	27.00 / 29.30%	13.00 / 23.60%	48.00 / 17.30%	17.00 / 32.10%
RACE				
Caucasian	45.00 / 48.90%	31.00 / 56.40%	120.00 / 43.30%	19.00 / 35.80%
African American	1.00 / 1.10%	3.00 / 5.50%	14.00 / 5.10%	6.00 / 11.30%
American Indian or Alaska Native	NA	1.00 / 1.80%	2.00 / 0.70%	NA
Hispanic/Latino	46.00 / 50.00%	20.00 / 36.40%	138.00 / 49.80%	28.00 / 52.80%
AGE GROUP				
18-25	18.00 / 14.50%	37.00 / 40.20%	83.00 / 30.00%	15.00 / 28.30%
26-35	30.00 / 54.50%	28.00 / 30.40%	110.00 / 39.70%	21.00 / 39.60%
36-45	8.00 / 14.50%	12.00 / 13.00%	48.00 / 17.30%	13.00 / 24.50%

46-55	4.00 / 7.30%	9.00 / 9.80%	31.00 / 11.20%	3.00 / 5.70%
56-65	5.00 / 9.10%	6.00 / 6.50%	4.00 / 1.40%	1.00 / 1.90%
66-75	NA	NA	1.00 / 0.40%	NA

Due to legal restrictions limiting some individuals in the type of environment in which they could be assigned, not all offenders were able to select the type of community service setting in which they may have preferred to serve out their hours. Specific offenders were not given the option to work in a horticultural environment given the community service location and/or the assigned tasks required for specific job duties. For example, specific offenders, such as alleged and/or convicted sex offenders, were assigned community service sites solely in compliance with their respective probationary and/or parole guidelines as set by the court (Pacheco, 2017). Although probation guidelines vary from county to county and are set by the court, such examples include not being able to work in or near a school zone, or coming into contact with any individual under the age of seventeen as mentioned in the Code of Criminal Procedure in section 42a (Pacheco, 2017).

Using analysis of variance tests, demographic comparisons were made of those serving in non-horticultural outdoor community service settings. In these comparisons, there were no differences in the incidence of recidivism found in comparisons of gender ($p=0.844$), ethnicity ($p=0.492$) and age ($p=0.638$) groups. Analysis of variance tests were also used to compare differences amongst demographic groups serving in non-horticultural indoor community service settings. Results showed there were no differences in incidence of recidivism found in comparisons of gender ($p=0.905$),

ethnicity ($p=0.893$) and age (0.759) groups. Analysis of variance tests were also used to make demographic comparisons of those serving in horticultural community service settings as well. Results indicated there were no differences in incidence of recidivism found in comparisons of gender ($p=0.264$), ethnicity (0.440) and age ($p=0.722$) groups. Therefore, no particular type of community service appeared to benefit one demographic group more than another. All demographic groups had similar numbers of recidivism regardless of the community service setting in which they served.

Past research indicates there are often differences in incidence of recidivism based on gender, age or ethnicity. For example, Langan and Levin (2002) published a report covering the recidivism rate of prisoners released and found men were 10.8% more likely to be rearrested when compared to women, African Americans were 10.2% more likely to be rearrested when compared to Caucasians, and Non-Hispanics were 6.8% more likely to be rearrested when compared to Hispanics. Langan and Levin (2002) also reported that the younger prisoners showed a higher rate of recidivism when compared to the older prisoner population. For example, more than 80% of those who reoffend were under the age of 18.

Findings Related to Objective Six

The sixth objective was to compare offenders, based on types of crimes committed, to observe whether those who have committed misdemeanors and those who have committed felonies benefit more from serving community service in horticultural environments.

The typical number of hours served at a particular location may vary from offender to offender depending upon the severity of the crime committed and/or if a

repeat offender committed the offense. On average, out of the 208 clients who committed a misdemeanor, those clients who completed horticultural community service served an average of 40 hours of required community service for their sentence. The 69 clients who committed a felony and completed horticultural community service on average served 122 hours for their community service sentence.

Analysis of variance tests were used to make comparisons of those who committed a misdemeanor versus those who committed a felony among those completing their community service hours in a non-horticultural outdoor environment and no differences were found in incidence of recidivism ($p=0.844$). Analysis of variance tests were used to make comparisons of those committing a misdemeanor versus those committing a felony amongst those completing their community service hours in a non-horticultural indoor environment. There were no differences in incidence of recidivism found in these comparisons ($p=0.231$). Analysis of variance tests were used to make comparisons of those who committed a misdemeanor versus those who committed a felony amongst those completing their community service hours in a horticultural environment. No differences were found in incidence of recidivism in these comparisons ($p=0.154$).

Therefore, in this study, no particular type of community service was found to benefit high versus low-level offenders more in terms of reducing recidivism. However, there is evidence that supports that recidivism is likely to change based on level of offense committed (Latessa et al., 2010; Council of State Justice Center, 2017). Research suggests programs directed at the treatment of high-risk offenders have been shown to have a much greater impact on rates of recidivism when compared to low-risk offenders

(Latessa et al., 2010; Council of State Justice Center, 2017). It has also been noted that programs for low-risk offenders are not always an effective use of resources and may actually be unhealthy because low-risk individuals are exposed to high-level offenders during programming (Council of State Justice Center, 2017). Other characteristics affecting recidivism among those who remain in the criminal justice system throughout their lives include extended unemployment, unstable residency, physical handicaps, poor mental health, history of substance abuse, and prior history of repeated run-ins with the law (DeLisi, 2001).

V. SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Purpose of the Study

The purpose of this study was to determine the differences in numbers of recidivism of offenders completing community service in horticultural environments versus those completing community service in non-horticultural environments. Specific objectives for this study included:

1. To investigate the types of community service options available for offenders in Hays County, Texas.
2. To investigate the recidivism numbers of offenders assigned community service in a horticultural environment.
3. To investigate the recidivism numbers of offenders assigned community service in a non-horticultural environment.
4. To compare differences in recidivism numbers of those offenders assigned horticultural work versus those assigned other types of community service work such as non-horticultural indoor or non-horticultural outdoor work.
5. To compare offenders, based on demographics, to observe whether any particular demographic group benefits more from completing their community service in different types of community service environments.
6. To compare offenders, based on types of crimes committed, to observe whether those who have committed misdemeanors and those who have committed felonies benefit more from serving community service in different types of community service environments.

Summary of the Review of Literature

The United States incarcerates the greatest percentage of its population when compared to any other nation in the world (Center for Economic and Policy Research, 2010). With such inflated prison populations and strong growth rates among the prison population, there is a growing concern regarding recidivism (Mears et al., 2012). During 2013, those sentenced and facing incarceration in a state or federal facility increased by 5,400 prisoners (Carson, 2014). In 2014, a 2% overall average decrease among populations within private correctional institutions was reported; however, there was a decrease in 15,400 state and federal incarcerated individuals (Carson and Anderson, 2016).

The cost of housing a single inmate totals \$38,000 annually (DeLisi, 2001), and “in 2008, federal, state, and local governments spent nearly \$75 billion on corrections, with the large majority [spent] on incarceration” (Schmitt et al., 2010, p. 10). Nonviolent offenders make up more than half of those who are serving time behind bars and this increase in incarceration is currently being explained by harsher sentencing policies rather than exacerbated levels of criminal activity (Center for Economic and Policy Research, 2010). Offenders, victims, their families, and the community feel the impact of criminal activity and incarceration (Bloom and Steinhart, 1993; Clear, 2007).

“What an inmate perceives or is able to perceive in his [or her] environment” is known to shape their experiences and decisions (Rice and Remy, 1994, p. 205), suggesting individuals commit crimes for a variety of reasons (Roberts, 2004). Therefore, distinguishing the differences between habitual offenders who blatantly and continually participate in illegal activities, from offenders who cease to participate in

illegal activities after a short period of time, is important when looking at an offender's alleged offense (Broadhurst, 2000). Identifying behaviors triggering an offender's likelihood of repeating criminal behavior, and being able to identify signs of such behavior early on can lead to potential adjustments in correcting criminal behavior, thus reducing recidivism (Broadhurst and Maller, 1991). Cohen et al. (1991) found lack of education to be a key characteristic when looking at identifying factors that predict recidivism. Broadhurst and Maller (1991) stress the value of foreseeing future indicators and behaviors of high risk offenders in preparing professionals for implementing more efficient programs designed to prevent criminal activity.

However, not every offender is sentenced to imprisonment. The Bureau of Justice Statistics reported 1 in every 53 adults in the U.S. were under some form of community supervision by the end of 2015 (Kaeble and Bonczar, 2016). Community supervision, whether probation or parole, is a mandate ordered by the courts to be served outside of jail or prison (Kaeble and Bonczar, 2016). Probation is typically issued by the courts as an alternative to incarceration, whereas parole is a supervised conditional term contingent upon being released from prison (Kaeble and Bonczar, 2016). The purpose for court-ordered probation is for issuing an alternative to serving out time completing community service, opposed to incarceration (Kaeble and Bonczar, 2016).

As a means of vocational rehabilitation, the advantages to working in a horticultural environment include its ability to reach a wide range of individuals from criminals, to the mentally ill, to individuals with physical handicaps. The benefits of interacting with our natural environment reflect personal characteristics such as self-confidence and increased morale, and encouraging the progression of life (Relf, 1981).

Working outside and with nature could potentially benefit individuals completing their community service in horticultural environments. Organized horticultural activities provide numerous opportunities for independent growth among inmates by teaching them new skills that will assist them with life outside of prison and reintegrating back into society (Migura et al., 1997; Lindemuth, 2011). When applied, these skills have the potential to decrease the likelihood of reoffending while educating offenders on multiple outlooks and various approaches for analyzing their own personal perceptions of their quality of life (Migura et al., 1997).

Materials and Methods

Recidivism Data

Data were collected through obtaining offender profile probation revocation reports, agency records, and community service supervision reports from the Hays County Probation Office in San Marcos, Texas. The official documents presented information on individuals and their alleged and convicted offenses ranging from misdemeanors to felonies committed within Hays County between the dates of January 1, 2007 and September 19, 2012. Personal information regarding the offenders was divided into categories based on gender, ethnicity, age, degree of offense committed, misdemeanor A, misdemeanor B, misdemeanor C, felony 1, felony 2, felony 3, felony 4 and state felony. The information also included number of community service hours completed per each offender, per each agency and whether the offender showed any incidence of recidivism.

Sample Population

A total of 20,000 case numbers were collected from the Hays County Adult

Probation Office. This sample population included both non-violent and violent offenders classified by degree of offense committed.

Data Sorting and Organization

Information gathered from offender revocation reports and agency records were sorted and coded manually into Microsoft Excel (Seattle, WA). In order to protect client anonymity, personal information such as first and last names were not collected; the information and data points regarding each client's case number, gender, ethnicity, age and degree of offense committed were identified and coded accordingly.

Data Collection

From the original sample population of over 20,000 case ID numbers, 477 individual case numbers were randomly selected. The 477 case numbers were then individually cross referenced with the original database of information using Microsoft Excel (Seattle, WA) to identify and match for each case the total community service hours completed at a community service agency, the type of community service conducted and if the community service program was in a horticultural setting, non-horticultural indoor setting, non-horticultural outdoor setting or if there was no community service served.

Community Service Sites.

The Hays County Adult Probation Office collected information on the types of activities in which clients participated. The Hays County Adult Probation Office requires consenting community service agencies to provide a complete description of supervised job and documentation of whether the client would be completing technical, general labor, construction, janitorial, semi-technical, grounds maintenance or clerical work.

These reports were provided by Hays County Adult Probation and then evaluated in order to code each type of service as being horticultural, non-horticultural indoor or non-horticultural outdoor work.

Data Analysis

Data were analyzed using SPSS (Statistical Package for the Social Sciences 20.0) (Armonk, NY). Frequency, descriptive statistics and analysis of variance tests were conducted to analyze data and compare the recidivism numbers between horticultural work versus those assigned other types of community service work such as non-horticultural indoor or non-horticultural outdoor work. Demographic comparisons were made to evaluate if differences occurred between offenders of different genders, ethnicity, age and degree of offense committed.

Results and Discussion

Summary of findings related to Objective One

Objective one was to investigate the types of community service options available for offenders in Hays County, Texas. In Hays County, Texas, there were 52 different agencies available as options for community service during the time of the study. Out of the 52 community service agencies, 49% (25) provided horticultural work options, 42% (22) provided non-horticultural indoor work options and 9% (5) provided non-horticultural outdoor work options.

Summary of findings related to Objective Two

Objective two was to investigate the recidivism numbers of offenders assigned community service in a horticultural environment. Out of the 277 clients serving in a horticultural environment, 15 incidents of recidivism were reported at 5.4% among

offenders who completed their community service hours in a horticultural environment.

Current and previous research suggests horticulture programs are beneficial when it comes to rehabilitation and emphasizing vocational training among the adult prisoner population (Flagler, 1995; Cammack et al., 2002a). Much of the research conducted thus far has been with incarcerated individuals and has found that, upon release, offenders can use the vocational skills learned while incarcerated to apply for outside employment; therefore, they enhance their ability to contribute to the community and be a productive member of society. Results from the Cammack et al. (2001) study also showed decreasing recidivism rates within the juvenile offender population as a result of being engaged with horticulture.

With individuals suffering from substance abuse problems, the relationship between offenders and the horticultural environment in which they were working allowed them to observe how the upkeep and maintenance of a natural environment required just as much work as maintaining their sobriety and was just as rewarding (Richards and Kafami, 1999). This concept of working in a horticultural environment also ushered in parallels enabling people to connect with nature through their individual progress (Richards and Kafami, 1999).

Summary of findings related to Objective Three

Objective three was to investigate the recidivism numbers of offenders assigned community service in a non-horticultural environment. Recidivism rates were 14.10% (13) among those who served out their community service hours in non-horticultural indoor environments. When compared to the recidivism rates of those who served their community service in non-horticultural outdoor environments (9.10%, 5), non-

horticultural indoor community service environments were reported at a 5% (8) higher rate.

Researchers found areas of personal growth such as “values, beliefs, and attitudes” are applicable to different areas of a person’s life and benefit mental health (Rice et al., 1998, p. 263-264; Waliczek and Zajicek, 2016). In research with incarcerated individuals, the outdoors and natural environments were found to have benefits including reduced sick calls (Moore, 1981). However, limited research has been conducted with those on probation doing community service.

Summary of findings related to Objective Four

Objective four was to compare differences in recidivism numbers of those offenders assigned horticultural work versus those assigned other types of community service work such as non-horticultural indoor or non-horticultural outdoor work. Horticultural community service and non-horticultural outdoor community service resulted in statistically significantly less recidivism when compared to those doing indoor community service or no community service. These findings support previous research reporting that spending time in horticultural environments has beneficial effects (Dressner and Gill, 1994; Shields et al., 1985; Waliczek et al., 1996).

Previous research has also shown that being in an environment with nature reduces stress and produces a positive effect when working to restore the mind (Grinde and Patil, 2009; Hartig et al., 1991; van den Berg, 2005). Positive results were found when clients were working outdoors and/or with plants and flowers, supporting previous research which has found that spending time in outdoor environments benefited both children and young adults with socializing and developing interpersonal relationship

skills (Dressner and Gill, 1994; Shields et al., 1985; Waliczek et al., 1996). Socialization is also a common goal in horticultural therapy (Waliczek and Zajicek, 2016). Although known for treating adolescents, the soul purpose for programs such as Outward Bound focus on emerging the individual in various outdoor adventures (Neill, 2003; Williams, 2000). Outward Bound is a horticultural program focused on adolescents and targeting youth through socializing and various outdoor activities and adventures (Neill, 2003; Williams, 2000). These programs allow for individuals to be mentally and physically productive; giving room for the mind to wander while successfully completing their assigned work (Rutt, 2016; Waliczek and Zajicek, 2016). Juveniles who are bored, experience a loss of ambition, and are lacking direction and authority, are often led to crime (Newberry and Duncan, 2001). Research has also shown poor social skills can lead to crime among youths (Dahlberg, 1998).

Summary of findings related to Objective Five

Objective five was to compare offenders, based on demographics, to observe whether any particular demographic group benefits more from completing their community service in horticultural, non-horticultural indoor and non-horticultural outdoor environments. There were no statistically significant differences in comparisons between gender, ethnicity and age groups. Therefore, no particular demographic group appeared to benefit more or less in terms of reduced recidivism when completing their community service in horticultural, non-horticultural indoor or non-horticultural outdoor environments.

Summary of findings related to Objective Six

Objective six was to compare offenders, based on types of crimes committed, to

study whether those who have committed misdemeanors and those who have committed felonies benefit more from serving community service in horticultural, non-horticultural indoor and non-horticultural outdoor environments. Using analysis of variance tests, comparisons were made between those who committed a misdemeanor versus those who committed a felony to analyze if they benefited differently from completing community service in horticultural environments. No differences were found in numbers of recidivism among individuals who committed felonies when compared to individuals who committed misdemeanors completing community service in horticultural, non-horticultural indoor or non-horticultural outdoor environments.

However, there is evidence that supports programs such as those that seek to treat violent gang members. For instance, some programs promote cognitive-behavioral development and focus on principles of risk, need and responsibility and have been shown to reduce recidivism as well as improve behavioral conduct within high-risk offenders. Those who did not participate in any cognitive-behavioral programs continued to show higher rates of repeat serious offenses inside the correctional institution (Di Placido et al., 2006; Andrews and Bonta, 2003, p. 93). Cecil et al. (2000) also found that basic adult education programs are an effective and promising method for lowering rates of recidivism among the adult offender population as a whole. Latessa and Lowenkamp (2005) found a consensus among researchers who reported on human interventions within correctional facilities concurred there is not likely to be any effect on rate of recidivism from standard institutionalized punishment alone. Therefore, participating in horticultural programs upon being released from prison or while on probation for the continuation of vocational and/or cognitive-behavioral training championed with

community service could provide a sense of meaning and purpose to the individual, which could prove helpful for a successful transition back into society.

Statement of Conclusions

Offenders who completed their community service in horticultural or non-horticultural outdoor environments showed lower rates of recidivism when compared to offenders who completed their community service in non-horticultural indoor environments and those who had no community service. When possible, community service options should be made available to those on probation or parole and include the opportunity for exposure to nature and the outdoors.

A study launched and published by the BJS tracked a total of 404,638 state prisoners across 30 states from 2005 to 2010 and found 67.8% of prisoners released reoffended within 3 years and 76.6% reoffended within 5 years of being released (Durose et al., 2014). It was also reported that more than 36.8% (one third) of those who recidivated were arrested within the first 6 months of being released within the 5 year study period (Durose et al., 2014). With our nation's prisons filled to capacity, the demand for effective, and productive, activities and treatment programs that foster the reduction of recidivism is more crucial than ever. Whether skills are learned through horticultural vocational programs, therapy programs, Master Gardener programs, or they are self-driven, the importance of effective reentry into society for inmates cannot be overlooked. The effects of recidivism numbers impact not only society as a whole, but become far more prevalent and devastating the more the effects trickle down to the individual. Future research on the benefits of horticultural activities regarding those on probation will further support the limited amount of evidence contributing to the benefits

of horticultural community service programs.

Recommendations for Further Research

1. It is recommended that future research include qualitative interviews with offenders regarding the benefits and drawbacks to community service opportunities.
2. It is recommended this research be applied on a larger scale. For example, looking at the recidivism rate of those who complete their community service in horticultural environment versus non-horticultural environments on a national scale to see if the findings in relation to the population sample of Hays County are representative to the findings of the U.S. population as a whole.
3. It is recommended research regarding the recidivism rate of those who complete their community service in horticultural environments versus non-horticultural environments continue among researchers in order to better understand how to reduce recidivism.

LITERATURE CITED

- Agnew, R. 2006. General strain theory: Current status and directions for further research. *Taking stock: The status of criminological theory* 15:101-123.
- Albertson, K., and Fox, C. 2011. *Crime and economics: an introduction*. Routledge.
- Ameen, E. J., and Lee, D. L. 2012. Vocational training in juvenile detention: A call for action. *Career Develop. Quart.* 60(2):98-108.
- American Psychiatric Association. 2004. *Mental illness and the criminal justice system: Redirecting resources toward treatment, not containment*. Resource document: Arlington.
- Andrews, D.A., and Bonta, J. 2003. *The psychology of criminal conduct* (3rd ed.). Cincinnati, OH.
- Bales, W. D., and Mears, D. P. 2008. Inmate social ties and the transition to society does visitation reduce recidivism? *J. Res. in Crime Delinq.* 45(3):287-321.
- Barreras, R., Drucker, E., and Rosenthal, D. 2005. The concentration of substance use, criminal justice involvement, and HIV/AIDS in the families of drug offenders. *J. Urban Health.* 82(1):162-170.
- Becker, G. 1968. Crime and punishment: An economic approach. *J. Pol. Eco.* 76(2):169-217.

- Bloom, B., and Steinhart, D. 1993. Why punish the children?: A reappraisal of the children of incarcerated mothers in America. San Francisco, Calif. National Council on Crime and Delinquency.
- Broadhurst, R. 2000. Criminal careers, sex offending and dangerousness. *Dangerous offenders* 109-126.
- Broadhurst, R. G., and Maller, R. A. 1991. Estimating the numbers of prison terms in criminal careers from one-step probabilities of recidivism. *J. Quan. Crim.* 7(3):275-290.
- Broadhurst, R. (Ed.). 2000. *Dangerous offenders: Punishment and social order*. London: Routledge.
- Buchanan, C. 1997. *Brother crow, sister corn: Traditional american indian gardening*. Ten Speed Press.
- Bui, H. N., and Morash, M. 2010. The impact of network relationships, prison experiences, and internal transformation on women's success after prison release. *J. Offen. Rehab.* 49(1):1-22.
- Cammack, C., Waliczek, T. M. and Zajicek, J. M. 2001. The educational effects of a community-based horticultural program on the horticultural knowledge and environmental attitudes of juvenile offenders. *HortTechnology* 12(1):77-81.

- Cammack, C., Waliczek, T. M. and Zajicek, J. M. 2002a. The green brigade: The educational effects of a community-based horticultural program on the knowledge and environmental attitude of juvenile offenders. *HortTechnology* 12(1):77-81.
- Cammack, C., Waliczek, T. M. and Zajicek, J. M. 2002b. The green brigade: The psychological effects of a community-based horticultural program on the self-development characteristics of juvenile offenders. *HortTechnology* 12(1):82–86.
- Carson, E. A. 2014. Prisoners in 2013. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Washington, DC.
- Carson, E. A. 2015. Prisoners in 2014. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Washington, DC.
- Carson, E. A. and Anderson, E. 2016. Prisoners in 2015. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Washington, DC.
- Castillo, R. 2012. Probation Officer, Hays County, Texas Department of Criminal Justice. Personal Communication.
- Cecil, D. K., Drapkin, D. A., MacKenzie, D. L. and Hickman, L. J. 2000. The effectiveness of adult basic education and life-skills programs in reducing recidivism: A review and assessment of the research. *J. of Correct. Educ.* 51(2): 207-226.
- Center for Economic Policy and Research. 2010.

- Chung, Y. 2011. Children's exposure to paternal imprisonment: Incidence evolution, and correlates among young nonmarital children. *Child. Youth Serv. Rev.* 33(5):575-587.
- Clear, T. R. 2007. *Imprisoning communities: How mass incarceration makes disadvantaged neighborhoods worse.* Oxford University Press, USA.
- Clear, T. R., Rose, D. R. and Ryder, J. A. 2001. Incarceration and the community: The problem of removing and returning offenders. *Crime and Delinquency* 47(3):335-351.
- Cobbina, J. E. 2010. Reintegration success and failure: Factors impacting reintegration among incarcerated and formerly incarcerated women. *J. Offen. Rehab.* 29(3):210-232.
- Council of State Justice Center. 2017. Principles of recidivism reduction. Retrieved April 24, 2017, from <https://csgjusticecenter.org/reentry/principles-of-recidivism-reduction/>.
- Cullen, F. T., Williams, N., and Wright, J. P. 1997. Work conditions and juvenile delinquency: Is youth employment criminogenic? *Crim. Just. Pol. Rev.* 8(2-3):119-143.
- Dahlberg, L.L. 1998. Youth violence in the United States: Major trends, risk factors, and prevention approaches. *Amer. J. of Prev. Med.* 14(4):259-272.

- DeWolfe, J., Waliczek, T. M., and Zajicek, J. M. 2011. The relationships between levels of greenery and landscaping at track and field sites, anxiety, and sports performance of collegiate track and field athletes. *HortTechnology* 21(3):329-335.
- De Leon, G., Melnick, G., Thomas, G., Kressel, D., and Wexler, H. K. 2000. Motivation for treatment in a prison-based therapeutic community. *Amer. J. Drug & Alcohol Abuse* 26(1):33-46.
- DeLisi, M. 2001. Scaling archetypal criminals. *Amer. J. Crim. Just.* 26(1):77-92.
- Delta Society. 2012. Animal-assisted activities - therapy 101. Retrieved November 11, 2012, from <http://www.deltasociety.org/Page.aspx?pid=317>.
- Di Placido, C. et al. 2006. Treatment of gang members can reduce recidivism and institutional misconduct. *Law and Human Behavior* 30(1):93-114.
- Devilly, G. J., Sorbello, L., Eccleston, L., and Ward, T. 2005. Prison-based peer-education schemes. *Aggression and Violent Behavior* 10:219-240.
- Doxey, J.S., Waliczek, T. M., and Zajicek, J. M. 2009. The impact of interior plants in university classrooms on student course performance and on student perceptions of the course and instructor. *HortScience* 44(2):384-391.
- Dravigne, A., Lineberger, R. D., Waliczek, T. M., and Zajicek, J. M. 2008. The effect of live plants and window views of green spaces on employee perceptions of job satisfaction. *HortScience* 43(1):183-187.

- Dressner, M. and Gill, M. 1994. Environmental education at summer nature camp. *J. Environ. Educ.* 25(3):35-41.
- Durose, M. R., Cooper, A.D., and Synder, H.N. 2014. Recidivism of prisoners released in 30 states in 2005: Patterns from 2005-2010 (pdf, 31 pages). Bureau of Just. Stats. Spec. Report.
- Felony. 2003. *The American Heritage Dictionary of the English Language, Fourth Edition*. Retrieved November, 9 2012, from <http://www.thefreedictionary.com/felony>.
- Fjeld, T. 2000. The effect of interior planting on health and discomfort among workers and school children. *HortTechnology* 10(1):46-52.
- Fjeld, T., Veiersted, B., Sandvik, L., Riise, G., and Levy, F. 1998. The effect of indoor foliage plants on health and discomfort symptoms among office workers. *Indoor & Built Environ.* 7(4):204-209.
- Flagler, J. S. 1995. The role of horticulture in training correctional youth. *HortTechnology* 5:185-187.
- Freeman, R. B., and Wise, D. A. 1982. Economic determinants of geographic and individual variation in the labor market position of young persons. *The youth labor market problem: Its nature causes and consequences*. University of Chicago Press 115-154.

- Genreau, P., Little, T., and Goggin, C. 1996. A meta-analysis of the predictors of adult offender recidivism: What works!. *Criminology* 34(4):575-608.
- Giglotti, C. M., and Jarrott, S. E. 2005. Effects of horticulture therapy on engagement and affect. *Canadian J. on Aging/La Revue canadienne du vieillissement* 24(4):367-377.
- Glaze, L. E., and Parks, E. 2011. Correctional populations in the United States, 2011. *Population* 6(7):8.
- Grinde, B., and Patil, G. G. 2009. Biophilia: does visual contact with nature impact on health and well-being? *Intern. J. of Environ. Res. and Pub. Health* 6(9):2332-2343.
- Grossmann, R. S. 1979. Horticultural therapy programs in Britain and the United States. *HortScience* 14(6):690-691.
- Hairston, C. 2003. Prisoners and Their Families. Prisoners once removed: The impact of incarceration and reentry on children, families, and communities 259-284.
- Haller, R. 1998. Vocational, social, and therapeutic programs in horticulture. *Horticulture as therapy: Principles and practice* 43-48.
- Hartig, T., Mang, M., and Evans, G.W. 1991. Restorative effects of natural environment experiences. *Eviron. Behavior* 23:3-26.
- Henrichson, C., and Delaney, R. 2012. The price of prisons: What incarceration costs taxpayers. New York: Vera Institute of Justice.

- Hoffman, A. J., Knight, L. F. M and Wallach, J. 2007. Gardening activities, education, and self-esteem learning outside the classroom. *Urban Education* 42(5):403-411.
- Horticulture. 2011. *The American Heritage Dictionary of the English Language, Fifth Edition*. Houghton Mifflin Harcourt Publishing Company. Retrieved from <http://ahdictionary.com/word/search.html?q=horticulture> July 20, 2013.
- James, D. J., and Glaze, L. E. 2006. Mental health problems of prison and jail inmates. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Washington, DC.
- Janick, J. 2000. Ancient egyptian agriculture and the origins of horticulture. *International Symposium on Mediterranean Horticulture: Issues and Prospects* 582:23-39.
- Jaspersen, R. A. 2010. Animal-assisted therapy with female inmates with mental illness: A case example from a pilot program. *J. Offen. Rehab.* 49(6):417-433.
- Jenkins, R. 2016. Landscaping in lockup: The effects of gardening programs on prison inmates. *Graduate Theses & Dissertation*. 6.
http://scholarworks.arcadia.edu/grad_etd/6
- Kaplan, S. 1995. The restorative benefits of nature: Toward an integrative framework. *J. of Environ. Psych.* 15(3):169-182.
- Kaeble, D., and Bonczar, T. P. 2016. Probation and parole in the United States, 2015. Bureau of Just. Stats.

- Knight, R. J. 1993. The role of horticulture in human well-being and social development: A national symposium. Based on a symposium held in Arlington, VA. April 19-21, 1990. Diane Relf. *The Quart Rev. of Bio.* 68(3):435-436.
- Krasny, M. E., and Khatib, D. 2015. Greening programs to facilitate prisoner reentry.
- Krejcie, R. V., and Morgan, D. W. 1970. Determining sample size for research activities. *Educ psych meas.* 30(3):607-610.
- Langan, P. A., and Levin, D. J. 2002. Recidivism of prisoners released in 1994. *Federal Sentencing Reporter* 15(1):58-65.
- Latessa, E. J., Lovins, L. B., and Smith, P. 2010. Follow-up evaluation of Ohio's community based correctional facility and halfway house programs – outcome study. Cincinnati: University of Cincinnati Center for Criminal Just. Resear.
- Latessa, E. J., and Lowenkamp, C. 2005. What worked in reducing recidivism. *Univ. St. Thomas Law J.* 3:521-535.
- Laub, J., Nagin, D. S., and Sampson, R. J. 1998. Trajectories of change in criminal offending: Good marriages and the distance process. *American Sociological Rev.* 63:225-238.
- Laux, J. M., Calmes, S., Moe, J. L., Dupuy, P. J., Cox, J. A., Ventura, L. A., and Lambert, E. 2011. The career counseling needs of mothers in the criminal justice system. *J. Offen. Rehab.* 50(3):159-173.

- Lewis, C. A. 1996. *Green nature-human nature: The meaning of plants in our lives*.
University of Illinois Press.
- Lindemuth, A. 2011. Can prison landscape be secure, restorative, and ecologically sustainable? [Blog post]. Retrieved from
<http://www.healinglandscapes.org/blog/2011/01/can-prison-landscapes-be-secure-restorative-and-ecologically-sustainable-guest-post-by-amy-lindemuth/>
- Listwan, S. J., Sullivan, C. J., Agnew, R., Cullen, F. T., and Colvin, M. 2013. The pains of imprisonment revisited: The impact of strain on inmate recidivism. *Justice Quarterly* 30(1):144-168.
- Lohr, V. I., and Pearson-Mims, C. 2000. Physical discomfort may be reduced in the presence of interior plants. *HortTechnology* 10(1):53-58.
- Lohr, V. I., and Relf, P. D. 2000. An overview of the current state of human issues in horticulture in the United States. *HortTechnology* 10(1):27-33.
- MacKain, S. J., and Messer, C. E. 2004. Ending the inmate shuffle: An intermediate care program for inmates with a chronic mental illness. *J. Forensic Psych. Practice* 4(2):87-100.
- Markman, J. A., Durose, M. R., Rantala, R. R. and Tiedt, A. D. 2016. Recidivism of offenders placed on federal community supervision in 2005: Patterns from 2005 to 2010. Bureau of Just. Stats.

- Matejkowski, J., and Ostermann, M. 2015. Serious mental illness, criminal risk, parole supervision, and recidivism: Testing of conditional effects. *Law and Human Behavior* 39(1):75.
- Matthews, J., and Waliczek, T. M. 2010. The relationship between levels of greenery and landscaping at track and field sites, anxiety and sports performance of collegiate track and field athletes. *HortScience* 45(8):117.
- Mattson, R. H. 1992. Prescribing health benefits through horticultural activities. The role of horticulture in human well-being and social development: A national symposium. Timber Press, Portland, Oregon 161-168.
- McFarland, A. L., Waliczek, T. M., and Zajicek, J. M. 2010. Graduate student use of campus green spaces and the impact on their perceptions of quality of life. *HortTechnology* 20(1):186-192.
- Mears, P. D., Cochran, C. J., and Bales, W. D. 2012. Gender differences in the effects of prison on recidivism. *J. Crim. Just.* 40(5):370-378.
- Milburn, K. 1995. A critical review of peer education with young people with special reference to sexual health. *Health Educ. Research* 10:407-420.
- Migura, M. M., Whittlesey, L. A., and Zajicek, J. M. 1997. Effects of a vocational horticulture program on the self-development of female inmates. *HortTechnology* 7(3):299-304.

- Misdemeanor. 2003. The American Heritage Dictionary of the English Language, Fourth Edition. Retrieved November 9, 2012, from <http://www.thefreedictionary.com/misdemeanor>.
- Moffitt, T. E. 2001. Adolescence-limited and life-course persistent antisocial behavior: A developmental taxonomy. *Life-course criminology: Contemporary and classic readings*. Wadsworth Press.
- Mohammad, H. and Mohamed, W. A. 2015. Reducing recidivism rates through vocational education and training. *Procedia-Social and Behav. Sci.* 204:272-276.
- Moore, E. O. 1981. A prison environment's effect on health care service demands. *J. Environ. Systems* 11(1):17-34.
- Neill, J. T. 2003. Reviewing and benchmarking adventure therapy outcomes: Applications of meta-analysis. *The J. of Exper. Educ.* 25(3):316-321.
- Neugarten, B. L., Havighurst, R. J., and Tobin, S. S. 1961. The measurement of life satisfaction. *J. Gerontol.* 16:134-143.
- Newberry, A. L. and Duncan, R. D. 2001. Roles of boredom and life goals in juvenile delinquency. *J. of App. Soc. Psych.* 31(3):527-541.
- Offender. 2003. The American Heritage Dictionary of the English Language, Fourth Edition. Retrieved November 9, 2012, from <http://www.freedictionary.com/Offender>.

- Pacheco, L. 2017. Deputy Director of Hays County Adult Probation. Hays County, Texas
Department of Criminal Justice. Personal Communication.
- Park, S. H., and Mattson, R. H. 2009. Therapeutic influences of plants in hospital rooms
on surgical recovery. *HortScience* 44(1):102-105.
- Petersilia, J. 2003. *When prisoners come home: Parole and prisoner reentry*. Oxford
University Press, USA.
- Polomski, R. F., Johnson, K. M., and Anderson, J. C. (1997). Prison inmates become
Master Gardeners in South Carolina. *HortTechnology* 7(4):360-362.
- Pope, A. W., McHale, S. M. and Craighead, W. E. 1988. *Self-esteem enhancement with
children and adolescents*. Pergamon Press. New York.
- Probation. 2003. *The American Heritage Dictionary of the English Language, Fourth
Edition*. Retrieved November 9, 2012, from
<http://www.thefreedictionary.com/Probation>.
- Pudup, M. B. 2007. It takes a garden: Cultivating citizen-subjects in organized garden
projects. *Geoforum* 39(3):1228-1240.
- Recidivism. 2012. *American Heritage Dictionary*. Retrieved November 9, 2012, from
<http://www.ahdictionary.com/word/search.html?q=recidivism>.
- Rehabilitation. 2012. Princeton University. Retrieved April 14, 2013, from
<http://www.thefreedictionary.com/rehabilitation>.

- Relf, P. R. 1981. The use of horticulture in vocational rehabilitation. *J. Rehab.* 47(3):53-56.
- Rice, J. S., and Remy, L. L. 1994. Evaluating horticultural therapy: The ecological context of urban jail inmates. *J. Home & Consumer Hort.* 1(2-3):203-224.
- Richards, H. J., and Kafami, D. M. 1999. Impact of horticultural therapy on vulnerability and resistance to substance abuse among incarcerated offenders. *J. Offen. Rehab.* 29(3-4):183-193.
- Roberts, D. E. 2004. The social and moral cost of mass incarceration in African American communities. *Stanford Law Rev.* 1271-1305.
- Ruddell, R., Broom, I., and Young, M. 2010. Creating hope for life-sentenced offenders. *J. Offen. Rehab.* 49(5):324-341.
- Rutt, D. 2016. Prison Horticulture. In T. M. Waliczek (Ed) and J. M. Zajicek (Ed), *Urban Horticulture*. CRC Press. 179-204.
- Sampson, R. J., and Laub, J. H. 1993. *Crime in the making: Pathways and turning points through life*. Harvard University Press.
- Sandel, M. H. 2004. Therapeutic gardening in a long-term detention setting. *J. Juven. Just. Serv.* 19(1):123-131.
- Santos, M. G. 2006. *Inside: Life behind bars in America*. St. Martin's Press.

- Scott, D. L., Crow, M. S., and Thompson, C. J. 2010. Tempest in a therapeutic community: Implementation and evaluation issues for faith-based programming. *J. Offen. Rehab.* 49(1):39-51.
- Shields, J. M., Abrams, P., and Siegel, S. 1985. An alternative health care setting for children with cancer: A residential summer camp. *Children's Health Care. J. Assn. Care of Children's Health.* 13(3):135-138.
- Shoemaker, C.A., Randall, K., Relf, P.D., and Geller, E.S. 1992. Relationships between plants, behavior, and attitudes in an office environment. *HortTechnology* 2(2):205–206.
- Sickmund, M. 2010. Juveniles in residential placement, 1997-2008. U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.
- Schmitt, J., Warner, K., and Gupta, S. 2010. The high budgetary cost of incarceration. Washington, DC: Center for Economic and Policy Research. [http://www. cepr. net/documents/publications/incarceration-2010-06.pdf](http://www.cepr.net/documents/publications/incarceration-2010-06.pdf).
- Söderback, I., Söderström, M., and Schäländer, E. 2004. Horticultural therapy: The 'healing garden' and gardening in rehabilitation measures at danderyd hospital rehabilitation clinic, sweden. *Developmental Neurorehabilitation* 7(4):245-260.
- Solvic, P. 1966. Risk-taking in children: Age and sex differences. *Child Develop.* 37(1):169-176.

Sommerfeld, A. J., Waliczek, T. M., and Zajicek, J. M. 2010. Growing minds:
Evaluating the effect of gardening on quality of life and physical activity level of
older adults. HortTechnology 20(4):705-710.

Sutherland, E. H., and Cressey, D. R. 1992. Principles of criminology. Rowman &
Littlefield.

Tex. Penal Code § 12.21 (1994).

Tex. Penal Code § 12.04 (1994).

Tex. Penal Code § 12.22 (1994).

Tex. Penal Code § 12.23 (1994).

Tex. Penal Code § 12.31 (1994).

Tex. Penal Code § 12.32 (1994).

Tex. Penal Code § 12.33 (1994).

Tex. Penal Code § 12.34 (1994).

Tex. Penal Code § 12.35 (1994).

Tex. Code Crim. Proc. Ann. art. 42a (West, 2017).

- Therapy. 2003. The American Heritage Dictionary of the English Language, Fourth Edition. Retrieved November, 9 2012, from <http://www.thefreedictionary.com/therapy>.
- Therapeutic community. 2012. Medical Dictionary for the Health Professions and Nursing Retrieved from <http://medicaldictionary.thefreedictionary.com/therapeutic+community>>therapeutic community.
- Thomsen, J. D., Sønderstrup-Andersen, H. K. H., and Müller, R. 2011. People-plant relationships in an office workplace: Perceived benefits for the workplace and employees. *HortScience* 46(5):744-752.
- Trusts, P. C. 2011. State of recidivism: The revolving door of America's prisons. Pew center on the states, Public safety performance project.
- Turner, G., and Shepherd, J. 1999. A method in search of a theory: Peer education and health promotion. *Health Educ. Res.* 14:235-247.
- Waliczek, T. M., Mattson, R. H., and Zajicek, J. M. 1996. Psychological benefits of community gardening. *J. Environ. Hort.* 14(4):204-209.
- Waliczek, T. M., and Zajicek, J. M. 1999. School gardening: Improving environmental attitudes of children through hands-on learning. *J. Environ. Hort.* 17:180-184.
- Waliczek, T. M., and Zajicek, J. M. 2016. *Urban Horticulture*. CRS Press.

- Waliczek, T. M., Zajicek, J. M., and Lineberger, R. D. 2005. The influence of gardening activities on consumer perceptions of life satisfaction. *HortScience* 40(5):1360-1365.
- Ward, S. A. 2009. Career and technical education in united states prisons: What have we learned? *J. Correct. Educ.* 60(3):191-200.
- Waul, M., Travis, J., and Solomon, A. 2002. Background paper: The effect of incarceration and reentry on children, families, and communities. Retrieved from <http://www.urban.org/publications/410632.html>.
- Wexler, H. K., Falkin, G. P., and Lipton, D. S. 1990. Outcome evaluation of a prison therapeutic community for substance abuse treatment. *Crim. Justice and Behavior* 17(1):71-92.
- Ulrich, R. S. 1983. Aesthetic and affective response to natural environment. In *Behavior and the natural environment*. In Altman, I. and Wohlwill, J. (Eds.), *Human behavior and environ: Advances in theory and research*. New York: Plenum. Vol. 6:85-125.
- Ulrich, R. S. 1992. How design impacts wellness. *The Healthcare Forum J.* 35(5):20.
- Ulrich, R. S. et al. 1991. Stress recovery during exposure to natural and urban environments. *J. Environ. Psychol.* 11:201-230.

- Ulrich, R. S., and Parsons, R. 1992. Influences of passive experiences with plants on individual well-being and health. *The Role of Horticulture in Human Well-being and Social Development*. 93-105.
- United States Census Bureau. 2015. Quick facts, hays, county texas. Retrieved April 15, 2017, from <http://www.census.gov/quickfacts/table/PST045216/48209>.
- Vacca, J. S. 2004. Educated prisoners are less likely to return to prison. *J. Correct. Educ.* 297-305.
- van den Berg, A. E. 2005. Health impact of healing environments: A review of evidence of benefits of nature, daylight, fresh air and quiet in healthcare settings. Univ. Medical Center Groningen, Wageningen.
- Williams, B. 2000. The treatment of adolescent populations: An institutional vs. a wilderness setting. *J. of Child and Adoles. Group Therapy* 10(1):47-56.
- Zajac, G. 2001. Special focus on therapeutic communities. *Res. in Rev.* 4(2):2-5.